

# (12) United States Patent

## Choo et al.

# (54) **REFRIGERATOR**

Applicant: LG ELECTRONICS INC., Seoul

Inventors: Ayoung Choo, Seoul (KR); Jaeyoul

Lee, Seoul (KR); Taegyeong Kim, Seoul (KR); Myeongha Yi, Seoul (KR)

Assignee: LG Electronics Inc., Seoul (KR)

Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

(21) Appl. No.: 14/631,505

(22)Filed: Feb. 25, 2015

(65)**Prior Publication Data** 

> US 2015/0276304 A1 Oct. 1, 2015

(30)Foreign Application Priority Data

Mar. 28, 2014 (KR) ...... 10-2014-0036537

(51) Int. Cl.

F25D 25/02 (2006.01)F25D 25/04 (2006.01)

A47B 57/08 (2006.01)

(52) U.S. Cl.

...... F25D 25/024 (2013.01); F25D 25/02 (2013.01); A47B 57/08 (2013.01); F25D 25/04

(2013.01)

57/485:

(58) Field of Classification Search

CPC ...... F25D 25/00; F25D 25/02; F25D 25/021; F25D 25/024; F25D 25/025; F25D 25/027; F25D 25/04; F25D 23/067; A47B 57/06; A47B 57/08; A47B 57/10; A47B 57/20; A47B 57/22; A47B 57/26; A47B 57/265; A47B 57/30; A47B 57/32; A47B 57/34; A47B 57/48; A47B 57/482; A47B

(Continued)

(10) Patent No.:

US 9,638,458 B2

(45) Date of Patent:

May 2, 2017

#### (56)References Cited

#### U.S. PATENT DOCUMENTS

1.257.998 A \* 3/1918 A. B. Gruber ...... 292/170 2,739,864 A \* 3/1956 Saunders ...... 312/306 (Continued)

### FOREIGN PATENT DOCUMENTS

DE 10 2010 030 580 A1 12/2011 DE 10 2011 075 102 A1 11/2012 (Continued)

### OTHER PUBLICATIONS

European Search Report dated Oct. 2, 2015 issued in Application No. 15158851.4.

Primary Examiner — Andrew Roersma

(74) Attorney, Agent, or Firm — KED & Associates, LLP

#### ABSTRACT (57)

A refrigerator may include a cabinet defined with a storage chamber therein, and a shelf assembly mounted in the storage chamber provided with a vertically movable shelf. The shelf assembly includes a guide member mounted in the storage chamber while having guide slots inclinedly formed at side walls of the guide member. The shelf is supported by the guide member to be vertically movable. Guide protrusions are provided at opposite lateral ends of the shelf to protrude laterally and are supported by the guide slots in a state of being slidably engaged in the guide slots. The guide slots have bent upper ends forming upper seats to support the guide protrusions. Each upper seat is formed such that a straight vertical line extending downwards from a center of the upper seat passes through a center of a lower seat formed at the corresponding guide slot.

#### 20 Claims, 7 Drawing Sheets

